



# Responsibilities of Teachers, Students, Parents, Administrators

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For students to achieve the high levels of mathematical understanding promoted in this framework, all parties to the educational process—teachers, students, parents, and administrators—need to play an active part in the process. Student success is maximized when all four parties coordinate their efforts. Teachers must take the responsibility for implementing a curriculum that provides students with a rigorous and meaningful experience in learning mathematics; students must respond by expending the effort to do as well as they can; parents must support and monitor student work; and administrators must provide the leadership that is central to a schoolwide mathematics program in which all students experience success.

Each of these four groups is responsible for lending support to the other three in pursuit of the goal of good education. This interlinked system of support consists of, at least, the following components:

- Establishing clear goals that are focused on students' learning of the mathematical content standards
- Developing a centralized system at the school level for monitoring students' academic progress
- Forging community and state partnerships based on clearly defined roles and responsibilities of all stakeholders
- Establishing a clear and consistent system of communication between school staff members and community stakeholders (e.g., parents, staff from local educational agencies, and business leaders)
- Having the goal that all students will leave school proficient in all grade-level standards covered in that particular school and ready for instruction in the grade-level standards in their next school, for enrollment in college-level mathematics, or for workplace training

## Responsibilities of Teachers

Students' success in mathematics depends on the teacher more than on any other factor. Teachers are responsible for teaching mathematics in a way that provides exciting, balanced, high-quality programs. Teachers must strive to create an environment that enhances the mathematical understanding of all students. Teachers should be thoroughly versed in the content of the mathematics curriculum and be able to use various instructional strategies to help all students learn. They should continually evaluate the effectiveness of their teaching strategies and the usefulness of tasks and assignments, making adjustments when necessary or appropriate. In addition, teachers are responsible for assessing and monitoring student progress regularly and for providing help, enrichment, or acceleration as needed.

The *California Standards for the Teaching Profession* provides a framework of six instructional areas that can be applied to mathematics and across the curriculum (California Commission on Teacher Credentialing 1997):

1. Engaging and supporting all students in learning
2. Creating and maintaining effective environments for student learning

Teachers' acquisition of this ever-expanding knowledge of the *what* and *how* of comprehensive and balanced mathematics instruction must be supported at all levels.

3. Understanding and organizing subject matter for student learning
4. Planning instruction and designing learning experiences for all students
5. Assessing student learning
6. Developing as a professional educator

Together with others in the school community, teachers are responsible for establishing good working relationships with parents and involving them as much as possible in their children's mathematics education. They should inform parents about appropriate roles for parents, expectations for student work, and student progress. Teachers should also make clear to parents the knowledge and skills contained in the *Mathematics Content Standards* and the nature of state assessments that measure student achievement.

Teachers who continue their own education and professional development throughout their careers are more likely than others to be acquainted both with mathematical content and with new developments in mathematics education. Their own professional growth should be as important to them as the growth and learning of their students.

Teachers' acquisition of this ever-expanding knowledge of the *what* and *how* of comprehensive and balanced mathematics instruction must be supported at all levels: state, county, district, and school. School district governing boards, superintendents, central office administrators, principals, mentors, teacher leaders, university faculty, subject-matter networks, and professional organizations also play key roles in developing and maintaining teachers' expertise.

Ideally, teachers and administrators will support each other in a cooperative relationship that has as its goal the highest possible achievement in mathematics for all students.

Teachers should notify administrators of any issues that require administrative intervention. These issues may range from student discipline and classroom management problems to more immediate practical needs, such as additional instructional materials, repair of classroom fixtures, reduction of noise that interferes with learning and instruction, or excessive interruptions.

## Responsibilities of Students

All students need a solid foundation in mathematics, and all are capable of learning challenging mathematical content, although individual differences in educational outcomes are inevitable. Students must recognize that learning and progressing in mathematics result from dedication and determination.

An essential starting point for students is to take their mathematics studies seriously by working to become proficient and by participating actively in classroom instruction. They must make a commitment to attend all scheduled classes, complete all homework assignments, and acquire a determination to resolve problems and difficulties. Ideally, students must support one another and must cooperate with their teachers. They must persist when the mathematics content becomes challenging.

Each level of mathematical growth requires mastery of the preceding level. At each stage students must learn and reinforce basic skills and also make a concerted effort to understand mathematical concepts and to apply those concepts and skills to problem solving. Students should also be encouraged to learn, understand, and master the many different dimensions of mathematics by learning to reason mathematically, to employ a variety of methods for problem solving, and to communicate and validate solutions mathematically, giving accurate and detailed proofs where needed. Although good teachers can provide encouragement and help, students are responsible for their own learning, and no one can learn for them.

Realistically, no one can expect all students to enter mathematics instruction with high levels of personal responsibility or motivation to learn mathematics. Students who are not highly responsible or motivated should not be ignored, however. Parents, the school, other stakeholders, and even the instructional materials should contribute to helping all students accept personal responsibility. Good schoolwide management plans, for example, can improve attendance dramatically. Many students need to be taught good study skills. Effective instruction will give students the success that, in turn, will motivate them to work toward more and greater success.

Teachers can provide needed support by stressing that mathematics learning requires considerable effort from all students and that persistent effort will greatly improve their learning and achievement. In other words gaining competency in mathematics does not require inherent mathematical talent, but it does require sustained effort and hard work (Stevenson et al. 1990). Finally, good in-class management systems will reduce the extent to which one student's lack of responsibility infringes on the efforts of others.

## Responsibilities of Parents and Families

Ideally, all parents should be strong advocates of their children's education. Many parents may need assistance and encouragement from the school to support them in this role.

Whether students are underachieving, average, gifted, or in need of individual attention, parents should recognize their own and their children's role in learning mathematics and achieving optimal success. They should know the specific academic standards their children are to meet at each grade level, and they should be able to monitor their children's performance and provide extra help when needed. Parents should be responsible for obtaining information regarding their children's progress and know how to interpret that information appropriately. Above all, they should encourage a positive attitude toward mathematics.

Parents are their children's first teachers. A child's early experiences with mathematics at home can provide an important foundation for learning the content standards for kindergarten (Saxe, Guberman, and Gearhart 1987). Parents and other family members can nurture and stimulate mathematics

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development in their children and, for many children, will need to be involved in their children's mathematics program at all grade levels (Stevenson et al. 1990).

However, schools must take greater responsibility to support the early mathematics development of children who are less fortunate and do not benefit from an educated, supportive family environment. Such support may require after-school homework, transportation services to bring children to school early for extra tutoring, extended tutoring support, and similar kinds of programs.

Parents should be encouraged to reinforce school learning of mathematics at home by setting aside a place and the time for homework. They should check regularly with their children to make sure that the assignments have been completed and the material understood. It would be very helpful if, in addition, they were to participate in both school and districtwide activities that may affect their children's education, such as developing curricula, selecting instructional materials and assessment instruments, and establishing local educational goals.

Parents should feel comfortable requesting information from the school about the existing mathematics curriculum and the standards for content and performance. The school should encourage these requests and make such information readily available by providing convenient access to instructional and enrichment materials. Ideally, each textbook will be accompanied by a publisher's handbook to help parents monitor their children's lessons.

Frequently, parents are reluctant to become involved in mathematics education because of their own lack of confidence with mathematics. Although parents do not have to be mathematicians to participate actively in their children's mathematics program, schools should consider inviting parents to participate in professional development opportunities designed for the improvement of their personal mathematics proficiency. Parents can support their children's mathematics education by ensuring that their children complete homework assignments and regularly attend school and by ensuring that their children recognize the importance of achievement in mathematics.

## Responsibilities of Administrators

Administrators are responsible for promoting the highest-quality mathematics programs. It is their job to hire and assign appropriately credentialed, skilled, and effective mathematics teachers and provide mentoring and professional support for teachers when necessary. They should also monitor teachers' implementation of the mathematics curriculum and evaluate teachers' ability to teach the curriculum and to assess student performance and progress. Administrators should ensure that the curriculum is coherent and consistent with the state standards and the guidelines in this framework. As much as possible, they should ensure continuity in the mathematics curriculum from classroom to classroom and among grade levels.

Administrators play a critically important leadership role. They are responsible for seeing that the schools maintain high standards for their mathematics offerings and that quality programs are implemented for all students. Effective

administrative leadership encourages teachers, students, and parents to recognize the importance of a quality mathematics program and actively support its implementation. Administrators should respond appropriately to teachers' concerns about student learning. They are also responsible for ensuring that each student has adequate and appropriate instructional materials and supplies of suitable quality.

Any explicit recommendation on what administrators can do to promote a successful program in mathematics is likely to involve funding and therefore decrease its chance of implementation. There is, however, an urgent recommendation that can be implemented without funding: *Administrators must provide uninterrupted instruction time to teachers.* Interruptions, such as intercom announcements, call slips and messages for students, and nonmathematical activities, such as field trips, athletic events, and other extracurricular activities, that take place during class time have a significant negative impact on mathematics instruction. Administrators are responsible for ensuring that such interruptions are limited as much as possible to real emergencies, with class time consistently protected and considered inviolable.

*Administrators should develop among staff, students, and parents a climate of partnership, teamwork, collaboration, and innovation to sustain high achievement.* Also essential is that administrators provide opportunities for teachers to develop collegial and collaborative relationships within their grade levels, including allowing adequate time for meetings and informal discussions. More precisely, administrators can use the suggestions in the list that follows to develop an environment that encourages achievement. Administrators should:

- Allot time at staff meetings (and perhaps invite experts to visit the school) to discuss recent research articles in mathematics and their usefulness and application to current school practices and the mathematics improvement plan.
- Provide time for monthly grade-level meetings that focus on assessing student progress toward achieving the standards and on modifying programs to improve student progress.
- Provide time for teachers to visit other classrooms, both within the school and at model implementation sites, to observe and discuss instructional strategies and materials used by teachers who are highly successful in fostering student learning and achievement in mathematics.
- Provide time for professional development on standards-based adopted instructional materials used in the school at the appropriate grade or course level and also many opportunities for staff members to receive coaching from those with expertise in teaching mathematics.
- Provide, if necessary, the resources needed to hire specially trained mathematics teachers so that these teachers can provide support to the faculty members for the implementation of the standards.
- Communicate to parents the school district's expectations for student performance, including the content of the state standards and the nature of state assessments that measure student achievement.